On the Ethics of Extraction in Environmental Sound Art

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Abstract: While there are ecological costs associated with music, sound art, and listening modalities, sonic extraction can also amplify urgent issues and provide listeners with access to threatened ecologies and places that put them at risk. Extractive listening can be both destructive and productive. This article is a call for a greater ethics, accountability, and critical nuancing of sonic extraction in contemporary sonic culture. How the ethics of extraction play out in environmental sound art that uses nonhuman resources is examined critically through three case studies: Hildegard Westerkamp's soundwalking field recordings of Pigeon Park and Lighthouse Park; Peter Cusack's field recordings of frogs from within Chernobyl's Exclusion Zone; and the transportation of zebra finches into the art gallery by Céleste Boursier-Mougenot. If extractivism is the process whereby natural resources are removed from the land and then used in the manufacturing of consumable goods or used as raw material for the production of energy and infrastructure, we can extend extractivism to include the removal of cultural resources from their original site, including techniques such as field recording and gallery installation.

Résumé : Si la musique, l'art du son et les modalités d'écoute ont un coût écologique, le « minage » sonore peut également aggraver des problèmes cruciaux et procurer aux auditeurs un accès aux écologies et aux lieux menacés, ce qui les met en danger. L'écoute « extractive » peut être à la fois destructrice et productive. Cet article est un plaidoyer pour davantage d'éthique, de responsabilisation et d'analyses nuancées de l'extraction sonore dans la culture acoustique contemporaine. Nous examinons sous un angle critique la façon dont se déploie l'éthique de l'extraction dans l'art de l'acoustique environnementale qui recourt aux ressources non humaines, à partir de trois études de cas : les enregistrements effectués par Hildegard Westerkamp lors de ses excursions sonores (soundwalking) à Pigeon Park et Lighthouse Park ; les enregistrements de terrain des grenouilles de la Zone d'exclusion de Tchernobyl effectués par Peter Cusack ; et le transport de diamants mandarins dans une galerie d'art par Céleste Boursier-Mougenot. Si l'extraction est le processus par lequel les ressources naturelles sont enlevées de la terre avant d'être employées à la fabrication de biens de consommation ou pour servir de matière première à la production

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d'énergie et d'infrastructures, nous pouvons étendre ce terme à l'enlèvement des ressources culturelles de leur site d'origine, y compris aux techniques telles que les enregistrements de terrain et les installations en galerie.

As I listen back to my own participation as a member of the production team in the 2005 production of R. Murray Schafer's *Patria 9: The Enchanted Forest*, which was mounted in the forest adjacent to Bone Lake in the Haliburton Forest and Wildlife Reserve in Ontario, I am reminded of the production's ecological footprint and the decisions the production team actively made to rehabilitate the site. During the process of aligning *The Enchanted Forest*'s ecological message of anti-logging activism and forest conservation with its site-specific production, the team realized that we were also contributing to environmental degradation. To build our performance structures, we used forest products, including lumber logged on-site as a part of Haliburton Forest's forest services and management division. Although the acquisition of that lumber was guided by the principles of sustainable forestry, and even though we had every intention of "returning" and rehabilitating the site following the final performance, our environmental footprint could not be ignored.

I returned to the site two summers later in 2007, when Patria Music Theatre Projects staged *Patria the Prologue: The Princess of the Stars*, performed on and around Bone Lake. That summer we camped in the forest that was once our performance site. Where our production tents, stages, and trails, well worn by city shoes, had once compressed the groundcover, foliage had since grown over and subsumed the stage platforms that we had built. While we removed some stage platforms, there were others that we were unable to dismantle. Surfaces decorated with nontoxic eco-friendly paints were weathered by precipitation, once again revealing the wood's grain. Although we took precautionary measures, there was no way to truly rehabilitate the land following our mounting of *The Enchanted Forest*. What follows are some of my current considerations about rehabilitation and reclamation projects involving sound art and extraction.

The terms extraction and extractivism ordinarily refer to the removal or an exploitative displacement of resources, labour, people, and/or information. One can extract coal from a West Virginia mine, oil from the Alberta tar sands, data from a Silicon Valley server, or, through recording, remove the call of a loon echoing across Georgian Bay. Extractive processes are also audible in everyday experiences of sound and music, what I refer to here as sonic extraction.

Listeners are implicated in the use of resin extracted from female lac beetles to manufacture 78 rpm shellac records (Devine 2019: 44–45); they can attune their ears to the reuse of actual world field recordings in *World of Warcraft*, the massively popular multiplayer online role-playing video game series (Turner 2016); or they can consider the interpretation of musical instruments in some museums, where they are placed behind glass and not heard, accompanied instead by an audio guide that may include a decontextualized sound sample (Robinson 2020; Mundy 2016).

This essay is a call for greater ethics, accountability, and critical nuancing of sonic extraction in contemporary sonic culture, specifically by sound artists who use methods of extraction, remixing, and rehabilitation to make ecological arguments through their work. Through three case studies, I critically examine how the ethics of extraction played out in environmental sound art that used nonhuman resources: Hildegard Westerkamp's soundwalking field recordings of Pigeon Park and Lighthouse Park, Peter Cusack's field recordings of frogs from within Chernobyl's Exclusion Zone, and the transportation of zebra finches into the art gallery by Céleste Boursier-Mougenot. I argue that while there are ecological costs associated with music, sound art, and listening modalities, sonic extraction can also be used to amplify urgent ecological issues and provide listeners with access to threatened ecologies and places that put listeners at risk. Extractive listening can be both destructive and productive. The interdisciplinary field of the environmental humanities has embraced an extended definition of extraction to include a wide range of activities and practices that participate in acts of resource removal and dispossession, accumulation and collection, as well as their social and ecological costs. My critical engagement with varied examples of sonic extraction contributes to the ongoing process of amplifying the relevance of sound studies and ethno/musicology in the environmental humanities.

As interdisciplinary literary scholar Imre Szeman has explained, extractivism "is more than just the name for a specific practice — the removal of raw materials from the earth's soil — and the social, political, and cultural actions and modalities associated with it, or even the name for an expanded set of practices of accumulation and the value production" (2017: 444). If extractivism is the process whereby natural resources are removed from the land and then used in the manufacturing of consumable goods or used as raw material for the production of energy and infrastructure, we can extend extractivism to include the removal of cultural resources from their original site, including techniques such as field recording and gallery installation. To help frame the context in which extraction is implicated in recording, listening, and creative practices, I am tracing the nuanced ways extraction applies to the technological

removal of individual and collections of sounds from their physical location of origin and their reuse in sound art to critically examine the resonances and aesthetics of the energy and extraction industries and what that means for music and sound studies.

The term sound art is deliberately inclusive, encompassing a range of sonic practices where sound is used as both the medium and subject. In the case of environmental sound art, the sonic materials used are intimately connected to ecology, human-nonhuman relations, environmental activism, or sensory perception, which includes the genres of soundscape composition, sonic journalism, and installation (the case studies in this essay). A number of environmental sound art practices (e.g., soundscape composition, sonic journalism) employ field recording, the practice of making audio recordings of sound, both human-produced and those made by nonhuman nature. Instead of making recordings in a studio, field recordings for sound art are made in everyday environments using portable recording equipment; thus, these audio recordings often capture the ambient soundscape in addition to the sound(s) the field recordists target with their microphone. With the technological advancement of increasingly mobile and inexpensive forms of audio recording, recordists and listeners must address the ethics of field recording and archiving soundscapes and how these sonic practices connect to the ethics of consumption where there is a finite limit on how long we can individually and collectively listen. Do we record and store the sounds of places just because we have the ability to access these locations with our field recorders? Do we continue to purchase increasing amounts of storage space on the Cloud while simultaneously knowing that we will never have enough time to listen again to each of our sonic specimens? Do we record and consume too much sound?

Extractivism in sound art is an important point of discussion in our conversations concerning ecological harm and devastation. We must consider how extractivism is paradoxically used as a creative tool to communicate ecological messages and to make soundscapes, particularly those on the periphery, accessible to a range of listeners. Extraction in its various definitions and applications in environmental sound art also refers to music where compositional and listening practices ambiguously serve as an ecological remedy while also inflicting environmental harm. There are many creative uses of environmental sound, including sonification, installation, sculpture, site-specific events, soundscape compositions, and other practices of studio-based composition, such as multi-channel and ambisonics (full-sphere surround sound format electroacoustic soundscape works). In many cases, soundscape compositions remove, rework, and remediate site-specific sounds to create immersive soundscapes that listeners can occupy from the comfort of their

high-quality headphones. As Kyle Devine has argued, while the digital music industry appears to produce less material discard, it is not a form of carbon-neutral listening because music streaming demands high energy use and large acreages of server farms. In his book *Decomposed* (2019), Devine has examined the ecological and environmental resonances beyond the music itself, focusing on the materiality of recording and listening formats, and investigating the ecological and environmental impacts of the music industry. By focusing on music as an element in a larger political economy, Devine incisively highlights processes of dispossession, removal, and decomposition that challenge music listeners, performers, and scholars to consider the sustainability of our listening habits and circulation formats, often obscured by the supposedly immaterial nature of the digital age.

Using three sound art compositions that take different approaches to extracting and relocating site-specific sound, I listen for extraction in Hildegard Westerkamp's soundscape compositions, Peter Cusack's sonic journalism, and Céleste Boursier-Mougenot's installation work, illustrating the ways sound and listening are utilized to acknowledge and amplify the significance of material forces and ecological sacrifices of sonic extractivism. While Devine has examined the hidden histories of human and nonhuman resource exploitation across formats of recorded music, I offer a different perspective on the role of resource extraction in music production: I ask artists and listeners to consider the exploitative and destructive but also productive ways artists engage in processes of sonic extraction in their use of site-specific sound to convey ecological messages. Each case study of sonic extraction demonstrates the complexities involved in the removal, recontextualization, and reuse (and sometimes also the rehabilitation) of sonic culture from their sites of origin. In the cases of Westerkamp and Cusack, their extraction involved field recording methods and, in the case of Boursier-Mougenot, the physical removal and re-homing of zebra finches in a gallery installation. In each case, extraction was invoked as a technique for composing ecologically responsive sound art.

Issues concerning the environment are intersectional and bound up in both productive and destructive ways with technologies and only recently have studies of music and the environment begun to adequately address these important intersections. Using these examples of extractive music from environmental sound art, I illustrate the material, cultural, and environmental realities of music that are caught up in complex contemporary ecological politics. A range of creative uses of technology have reshaped humanity's relations with the nonhuman world. Through their reverberations, echoes, and silences, these three case studies, or what I refer to as "extractive listening moments," underscore sound as a methodology, a mode of resistance, an approach to

processing ecological trauma and affect, and as a device that has the potential to inflict harm through the varied destructive and productive forms of extraction encountered in environmental sound art.

Extractive Listening Moment 1: Hildegard Westerkamp and Soundscape Composition

Hildegard Westerkamp has addressed the question of excessive sonic collection and consumption in her own listening, sound-making, and recording practice. After years of recording the soundscape as a member of the World Soundscape Project and Simon Fraser University's Sonic Research Studio, she re-evaluated her own listening perspective, and went on to reduce her recording practices, to archive only what was politically and artistically necessary, and to *listen* more. Westerkamp's self-reflection resonates with Dylan Robinson's argument that our listening positionalities shift over time and are shaped by our everyday relational contexts that are bound up in the institutions and structures of settler colonialism. Westerkamp's conscious shift in her sonic perception is an example of what Robinson has referred to as "critical listening positionality" in his theorization of decolonial and anticolonial listening practices (2020: 10–11). How Westerkamp framed her shift in recording and listening practices is also a statement on remediation, signalling past involvement in sonic over-extraction. It is not uncommon for field recordists to regularly record and archive their quotidian environment, generating large quantities of digital content in various formats, but few recordists use the bulk of these recordings. It wasn't that Westerkamp hadn't been using these sound resources; rather, she realized that she had tapes upon tapes stored away that she would never have the opportunity to listen to. The World Soundscape Project, the Simon Fraser University Sonic Research Studio, and Westerkamp herself, through her own field recording practices, had recorded in excess (Westerkamp 2020). What was initially intended as a process of reuse and recycling ultimately became a by-product of listening and recording, a form of sonic waste. Sonic waste, like many other forms of discard, is the by-product of the production, use, and disposal of consumer goods. For these reasons, environmental sound art is inseparable from the ethics of consumption (Nixon 2011: 103–28).

The sonic environment is not just a "resource" to be mined. The sonic environment of a place is comprised of complex ecologies, cultures, and people with histories of use, reciprocity, and exploitation. The sonic environment is a resource available to artists and listeners from which they can learn. It is imperative, however, that they learn about the places from which they are mining sounds. Nearly all of what we now refer to as British Columbia

is comprised of unceded Indigenous land. That is, members of the World Soundscape Project recorded and extracted soundscapes from territories that were never signed away by the Indigenous Peoples who inhabited them before European settlement across North America. Members of the World Soundscape Project were motivated to listen to and record the sonic environment of places that would be radically transformed by the rapid urbanization sweeping across Canada. Their work, however, avoids any discussion of the traumatic reshaping of the land by settler-colonialism that took place from first contact onward. Indeed, their recordings are not inclusive of all sound and all communities in Canada during the years of collection (Akiyama 2015), rather sounds were extracted from stolen land to study, archive, use in educational materials, and create sound work.

Sonic extraction in the forms of field recording and soundscape composition are not inherently "bad" or environmentally degradative. However, composers cannot simply approach the sonic environment as an infinitely plentiful creative resource. In Westerkamp's approach to sustainable sound making, listening, and recording, I hear her re-evaluating her relationships to the soundscapes that she has experienced firsthand, extracted from their original site, and reused across her ecologically activist work in sound. Her soundscape compositions, some of which use field recordings of unceded lands in Vancouver, allow for the exploration of the political and musical potential of remediated field recordings. Her personalized approach to field recording and soundscape composition involves listening to, recording, playing back, and contextualizing local soundscapes. Through her work with the World Soundscape Project, Westerkamp developed a nuanced understanding of the soundscape, and through her involvement with Vancouver Co-op Radio she organized and broadcast her field recordings in ways that "listened to" and would "speak back" to the community using "the sounds of its own making" (Westerkamp 1994: 87). Her sonic practice is defined by her use of a variety of recording techniques to frame and represent the sonic environment to listeners. These techniques include recorded soundwalks and mobile recording, stationary recording, the searching microphone, and close-miking. Westerkamp is also conscious of her own social and sonic responsibility as a curator and composer of soundwalks and soundscape compositions, yet there are gaps in her perspective and land knowledge.

In her soundscape compositions, Westerkamp invokes what she refers to as the "disruptive nature of listening" (2019) and "listening in unsettled times" (2017). Here, situated listening opens the senses to new experiences and understandings of places, contexts, and soundscapes. It is also where listening, recording, and composing with sounds extracted from a place or situation is a

productive social process that involves archiving, remembering, amplification, synthesis, and even interpretation. My discussion of two pieces shows different approaches she took with her soundwalk compositions and her attention to the sites in which the soundwalks took place.

Her concern for local residents is evident in *A Walk Through the City* (1981), for 2-channel audio with poetry and recitation by Norbert Ruebsaat. In this composition, Westerkamp attributed some of the recorded voices and other sound events (e.g., car horns, brakes, sirens, aircraft, construction, and pinball machines) as coming from her field recordings of Pigeon Park in the late 1970s. On her daily walks to the Vancouver Co-op Radio, she encountered Pigeon Park at the north corner of the busy intersection of Hastings and Carrall Streets, where the radio station was located at the time. This small triangular plot of land is a part of what we now know as Vancouver's rich history. Established in 1938 after the Canadian Pacific Railway (CPR) deeded the land to the city of Vancouver, the park is located on the traditional territories of the Squamish, Tsleil-Waututh, and Musqueam First Nations, and, in the 1900s, long before the park was established, a CPR spur line ran across the site connecting the False Creek Railyards with the main line on Burrard Inlet. Today, Pigeon Park is a popular Downtown Eastside gathering place, a site where homeless and the urban poor seek shelter, and where social justice events and protests, including ceremonies honouring victims of the Downtown Eastside, are held (Pawson 2016). As Klisala Harrison explains in her work on Indigenous music, poverty, and music for well-being, Vancouver's Downtown Eastside is notorious for the poverty that many members in this community experience (2013: 59; see also 2020).

Westerkamp played *A Walk Through the City* in some episodes of her program *Soundwalking* on Vancouver Co-op Radio. In these pieces, Westerkamp used techniques of sonic extraction and reuse as a form of social activism to highlight the people, the social and political environment, and the soundscapes of the storied Vancouver site. Westerkamp continues to draw on local sonic resources to comment on people and places that are always "unsettled," and to make the sonic pasts of Pigeon Park and other places around Vancouver audible as the physical site and its soundscape transform in response to local urban gentrification.

In contrast, Westerkamp composed *Lighthouse Park Soundwalk* (1977) using field recordings made while soundwalking through Lighthouse Park, which is located near the affluent residential area of West Vancouver across the bay from downtown. A popular tourist attraction and recognized in 1994 as a National Historic Site of Canada, Lighthouse Park has occupied a significant place in the lives of Vancouver residents and tourists. Like her more often-cited

soundscape composition *Kits Beach Soundwalk* (1989), Westerkamp's voice figures prominently in the sound mix. She recorded her spoken voice live, on location, while doing the soundwalk rather than after the fact in the studio. The final mix includes sounds Westerkamp references that she heard in the moment of listening and recording as well as sounds that Westerkamp does not directly reference; the field recorder's microphone did not record and perceive the same sonic experiences as Westerkamp's ears.

What sets *Lighthouse Park Soundwalk* apart from other soundscape compositions where Westerkamp weaves her own voice through the mix is her inclusion of spoken word fragments and longer quotes from Emily Carr, a settler Canadian painter and writer whose work was inspired by the Indigenous nations of the Pacific Northwest Coast. Westerkamp selected and included specific passages from Carr's diary-like reflections on the sounds of the Northwest forests where she lived and painted, some of which are coloured by her encounters with Indigenous communities and cultures, primarily the Haida, Gitxsan, and Tsimshian (Stewart 2005: 59–72). Westerkamp's selection of passages reflects her concern for presenting evocative textual images of place despite instances of Indigenous exoticism and the legacies of salvage ethnographic practices embedded in these texts. For some sound artists, the land is considered a physical, infrastructural, economic, and cultural site ready and available for extraction, and the land's resources, including plants, water, and even soundscapes are viewed as renewable, plentiful, and unexhaustive.

Field recording practices, such as those used by Westerkamp in her soundscape compositions, extract sound from site using processes of duplication, inscription, and storage. A sound recording is removed from its original context after being recorded, but the sound itself is not. These sounds, however, are not indelibly fixed to a place; recording and listening to sounds of the natural environment take on further meaning in the precarity of climate change and Indigenous land rights. Westerkamp's removal, duplication, and reuse of field recordings in her compositions extends their lifespans and provides access to a sonic past that has since been drastically changed. The ethics of representation and the politics of sound extraction, however, complicate the compositional goals and practices of soundscape composition.

Extractive Listening Moment 2: Peter Cusack's *Sounds from Dangerous Places*

What can we learn by listening to the sounds of dangerous places (Cusack 2012: vii)? This is the guiding question that sound artist Peter Cusack has examined

in his multimedia project *Sounds from Dangerous Places*, which is a book and a series of field recordings. In this project, Cusack has juxtaposed lightly edited field recordings against photographs that he took of the sites of precarity he visited and recorded, accompanied by writing in a journalistic style describing his sensory engagement with these places. Cusack used field recordings to extract soundscapes from places that few have access to firsthand, either by choice or regulation. Dangerous places, as Cusack has written, "can be both sonically and visually compelling, even beautiful and atmospheric. There is, often, an extreme dichotomy between an aesthetic response and knowledge of the 'danger,' whether it is pollution, social injustice, military or geopolitical" (Cusack 2012: vii). His field recordings focus on the effects of major ecological trauma experienced in places that are out of earshot and largely inaccessible because they threaten the health of living beings. In this case, sonic extraction facilitates access to these sites and amplifies the sounds produced by environmental violence inflicted on the land by energy industries. His recording of dangerous places can be viewed as a reparative form of extraction whereby site-specific sounds of ecological precarity are recorded, duplicated, removed from their site, and reframed by Cusack to amplify ecological and cultural concerns to listeners.

Sounds from Dangerous Places is the result of a decade of sonic fieldwork investigating places that have experienced residual environmental trauma, including the Caspian oil fields in Azerbaijan and Chernobyl's "Exclusion Zone." This field research required slow listening that unfolded over time in the form of multiple site visits to Chernobyl (2006/7) and Azerbaijan (2003/4) (Cusack 2012). In Azerbaijan, Cusack soundwalked the Caspian oil fields through the derelict, but still functioning, technologies of oil extraction and he collected field recordings along the tributaries of the Tigris and Euphrates river systems in Turkey where controversial dams were planned. In Chernobyl, he positioned himself and his field recorder within the Exclusion Zone, the 25 km area evacuated around the Ukrainian nuclear reactor that failed in 1986. While Cusack and Westerkamp both use field recording to provide listeners access to ecologically uncertain site-specific soundscape experiences, Cusack's locations differ from Westerkamp's because they are considered dangerous to visit and listen to firsthand.

Cusack refers to his work as "sonic journalism," a form of sound art where sound and recording are used to document the sonic environment of current cultural and political events through the combination of artistic and documentary modes of expression. For Cusack, sonic journalism is also a confluence of research and creation where he produces sound-focused multimedia documents containing his findings, including extensive audio and photographic materials, installations, radio broadcasts and streams, and public

talks. Cusack's sonic journalism highlights the limited access listeners have to the soundscapes of extraction and energy industries. Do we know what they sound like? Do we know what they sound like long after an environmental disaster?

Sounds from Dangerous Places highlights the sonic violence experienced by or inflicted upon these places and the industries entrenched in them, but also the vibrant sonic life that resurfaces and thrives after ecological and energy catastrophe. In Cusack's Chernobyl recordings, we listen to the legacy of the nuclear industry long after local residents were evacuated and contaminated animals slaughtered; 25 years later, labourers still commute into the Exclusion Zone to continue clean-up and run the still-functioning reactors and the wildlife resiliently has returned. He recorded radiometer bleeps, cavernous derelict rooms of abandoned possessions, labourers in the pub before their weekend home with their families, and the chorus of frogs and other wildlife that thrives.

"Chernobyl Dawn" and "Chernobyl Frogs" feature Cusack's recording of birds heard at dawn and frogs heard in the early evening, respectively, in the Exclusion Zone. The Exclusion Zone has become one of the most fertile sites for animal habitats to thrive, particularly notable due to its history of environmental catastrophe (Wendle 2016). While human residents were evacuated, contaminated wildlife were as well. Over the past decades, as the radiation dissipated, nonhuman animals returned to the site and "recolonized" the territory (Cusack 2012: 13), while humans stayed away. Some might argue, after listening to the soundscape that Cusack recorded, that some species, such as the frogs, flourished in these conditions where nature has the freedom to be wild, free from human constraint and management. However, the croaks and chirps of the frog chorus are not entirely a sonic cacophony that affirms the resilience of nature in the face of human-induced environmental traumas. Cusack's soundscape is a bit eerie, unsettling at times, and audibly more-than-human and more-than-frog, in that the frogs sound larger than life, not just in quantity, but in physicality and ability. They croak a little too loudly in great numbers, sketching a sonic vignette that could be heard as a community of enhanced frogs like those encountered in comic books, or a community of frogs who have thrived, adapting to their radioactive habitat.

The sound art Cusack composes from his field recordings acknowledges the ways toxic elements and distributions disproportionately affect those living in what Steve Lerner has called "sacrifice zones" — regions of political, social, and environmental precarity (Lerner 2012). Whereas the impact from Chernobyl was immediate, other forms of environmental disaster occur over a longer period of time. Slow disasters are a form of environmental trauma that operate within Rob Nixon's concept of "slow violence" (2011). Forms of slow

violence are felt by human and nonhuman inhabitants of the land over time and generations because their environmental cost and impact is long-term and reveals itself slowly in forms of delayed destruction, particularly in unprotected minoritized environments. Violence is customarily conceived as an immediate, spectacular, and instantaneously visible event. However, Nixon has argued that we must attend to other forms of violence, those that aren't spectacular, and those that unfold across a range of temporalities (2011: 2). Music and other art forms have the ability to voice and visualize these often silent, invisible, erased, and ignored yet contentious forms of environmental trauma.

Cusack has recorded soundwalks in some of the oldest still-operational Bibi Heybat oil fields in Azerbaijan on the Caspian coast, which is a resource-rich region exploited and commercialized by the global petroleum industry since the late 19th century. On the tracks "Oil Field Atmosphere," "Oilfield Soundwalk 1," and "Oilfield Soundwalk 2," listeners hear the creaks, squeaks, and clangs of old, poorly maintained oil extraction technologies. Each pump's distinct voice recedes and advances in the soundscape recording as Cusack walks around the oil field, repositions his field recorder, and returns to re-listen to a soundscape of ecological trauma that slowly and continuously unfolds. In his oil field recordings, the state of ecological degradation discloses little evidence of improvement. To report on the state of the Bibi Heybat oil fields, Cusack used a range of sound-based methodologies to evaluate the soundscape and its relationship to humans and nonhumans, including close-up and atmospheric field recording perspectives, and soundwalking. The oil fields are what Cusack has called "sonogenic" places — sonogenic being the sonic equivalent to photogenic — to refer to places and their soundscapes that are aesthetically stunning, even if their beauty is the result of toxic contamination (2012). The visual equivalent is the subtle beauty of widely distributed waste and landscapes transformed by large-scale human activity and terraforming illustrated by Edward Burtynsky in his photography (see, for example, *Manufactured Landscapes*, 2008, in the colourful liquid spectrum and reflective sheen of oil spills of Cusack's photography, and across the glossy *National Geographic* photo essay centrefold of the visually stunning, but uninhabitable Alberta oil sands and tailings ponds [Remillard 2011: 127–43]). These beautiful images of toxic spaces are what ethnomusicologist Jeff Titon has referred to as experiences of the "ecosublime" (2016: 28), the monumental grandeur and beauty of noxious environmental degradation.

The soundscape of Bibi Heybat is sonically rich and constantly shifting as loose mechanical sections of the oil rigs clatter, clang, and shimmer, as oil and industrial runoff viscously pools and stagnates, and as animals graze on the nutrient-poor grass while refugees resettle on the abandoned land next to the oil

fields. The "dangerous" sounds that Cusack extracts from "dangerous places" not only refer to the dangers of visiting and listening to these places firsthand, they also reference the environmental dangers inflicted on those who are forced to live on these resource rich and geopolitically and ecologically precarious lands.

Extractive Listening Moment 3: Céleste Boursier-Mougenot's *from here to ear*

At the Musée des beaux-arts de Montréal/Montreal Museum of Fine Arts I walk into a gallery transformed into an open-air cage for the 19th version of the installation *from here to ear* by French artist Céleste Boursier-Mougenot. The installation features 70 (or more) zebra finches and 14 Gibson guitars: ten white Studio model Gibson Les Paul electric guitars, and four Gibson Thunderbird bass guitars all hooked up to Roland amplifiers. The guitars rest horizontally on waist-height cymbal stands, providing spaces for the zebra finches to perch. Each guitar stand is rooted in sand among tufts of long grasses, imitating the native species habitat of the zebra finch, the Australian grasslands. The guitars are prepared with predetermined tunings and each time a zebra finch lands on, takes off from, hops on, or slides across their strings, the notes are played through an amplifier with preprogrammed digital effects (e.g., reverb, digital delay). Zildjian cymbals, too, are arranged in the sand across the room, serving as receptacles for water and birdseed and transformed into resonant bird feeders. I carefully walk along the flat sand-coloured walkways that delineate a pathway of circulation for visitors to follow, looking out for small zebra finches that could easily get underfoot. The birds alone are loud as their voices bounce off the walls of the room. When combined with the amplified guitars and contact mic-enabled cymbals, the room is cacophonous. I listen to the pings, muddy chords, shimmering strums, and complex reverb of amplified birds on a wire (or strings as was the case) perform for the viewer-listeners by flying between guitars, their feet and wings strumming clusters of notes and pecking at birdseed, activating shimmering cymbals as the zebra finches animate the gallery space. I listen to a male zebra finch struggle to free a twig embedded between the guitar strings. Pulling and manipulating the twig with its beak, the rough surface of the twig repeatedly strums the string, powerfully performing riffs and sonifying the bird's labour.

The human viewer-listeners of this constructed ecosystem are required to follow a series of strict installation protocols when engaging with the sonic space and its nonhuman inhabitants (the birds *and* the guitars). Visitors are prohibited from taking photographs, touching the guitars, cymbals, heavy

chain-link curtains, and birds. Each person must line up silently, slowly entering the space in small groups and leisurely walking and listening around the room at a pace that Boursier-Mougenot compares to taking "a walk in the countryside" (Art in Focus 2017). Visitors are also advised to avoid deliberately provoking or disturbing the zebra finches. These directions provide the illusion that the zebra finches are entirely unaffected by their installation in the gallery, that the conditions of the artwork do not disturb the birds, and that the anthropocentric reception that these extracted birds freely and joyfully perform make music for the enjoyment of visitors. These instructions also call attention to the fact that all ecosystems are sensitive and even the ecosystem of the installation needs to be experienced with care, recognizing the potential impact gallery visitors have on the birds.

Boursier-Mougenot's consideration of the gallery space accounts for the spatial relationships among different note combinations and preprogrammed effects. Additionally, the sounds produced by the birds and guitars are unique to each installation and the moments in which the birds engage with the instruments. Although the *from here to ear* series shares common artistic, ecological, and installation principles — a musical aviary where visitors listen in close proximity as the zebra finches compose a live mutable soundscape shaped by the ways the birds respond to the conditions of their environment, the visitors, and each other — Boursier-Mougenot considers each installation a unique work with its own performance ecology. For each iteration of the series, his musical system is defined by the spatiality of the gallery, the arrangement of materials in the exhibition space, and the nesting process as the re-homed birds adapt to his ecosystem of guitars, cymbals, amplifiers, and grassland landscape.

What distinguishes *from here to ear* from Westerkamp's soundscape compositions and Cusack's sonic journalism is that Boursier-Mougenot's work involves extracting nonhuman animals from the habitat that they were born into to be a part of a sound art installation while the other works involve recordings in/of carefully selected existing places. Instead of bringing field recordings of birdsong into the gallery spaces, the birds themselves are extracted and installed in the gallery as performers and musical instruments. Boursier-Mougenot's *from here to ear* augments the soundscape of a zebra finch aviary with another layer of sound, articulated as the birds embody and negotiate the spatial arrangement of the guitars and amplifiers.

from here to ear challenges the viewer-listener to consider nonhuman musicality as gallery visitors listen to the birds communicate and interact with the guitars *and* their species-specific calls and songs. However, this work also challenges audiences with the ethics of instrumentalization and instrumentality and the long history of how nonhuman specimens are displayed for the human

sensorium (Mundy 2018). Who and what is extracted from their environment and repurposed *as* an instrument in sound art when installed in an indoor gallery space? As musicologist Rachel Mundy has asserted, "When it comes to animals, natural history has traditionally been a practice of looking: looking in the field, in zoos, in museums, and in research collections," rather than listening (2016: 53). Whether through silencing the nonhuman in exhibits of taxidermied specimens put on display in natural history museums, the creation of bird field guides and apps that identify species by ear in their habitat, or a sound art installation like from here to ear, "sound occupies a special place in our reception of the non-human animal" (Mundy 2016: 53). What remains to be explored in sound art such as *from here to ear*, however, are the politics and ethics of nonhuman animal extraction and exhibition.

What is the environmental cost of this installation that explores sound, movement, and spontaneous composition as nonhuman musicking agents converge — zebra finches, guitars, cymbals, water, and birdseed? In works such as *from here to ear*, human listeners must consider the ethics of consent associated with recording, manipulating, and composing with nonhuman voices. How do those practices of recording and reusing voices differ from our treatment of human voices? In *from here to ear*, zebra finches are forcibly removed from their habitat and installed in the human-environment of the gallery that Boursier-Mougenot has adapted to resemble a natural habitat. Visitors are told that the birds come from Australia, where the species originates, and they have migrated to the gallery. This narrative is meant to create an aura of exoticism, but it also erases the problematic process of breeding birds as an art material, extracting them from their habitats, and re-homing them in the gallery for the temporary visual and musical pleasure of human spectators. For each installation, the zebra finches are acquired from local breeders and aviaries. The birds are already displaced from their natural habitat before they are installed in *from here to ear*. The domesticated birds for the Montréal iteration of *from here to ear* were sourced from a local breeder in Thetford Mines, Quebec (CBC News 2015). When I spoke with museum volunteers and curatorial staff, they highlighted the acts of care that informed their ethics of exhibiting and installing nonhuman living animals in the gallery. The museum worked with a team of veterinary technicians, including an avian veterinarian who regularly visited the gallery to ensure optimal living conditions for the finches were maintained. A healthy bird is an active bird and a sonorous bird. Once each installation has finished its exhibition run, the birds are returned to their "homes." However, these homes are not necessarily the natural habitat of the zebra finch. In version 19 in Montréal, the birds were returned to their breeder at the end of the exhibition.

The extracted birds try to nest and make a new home in the installation. The design is bright, clean, minimal, and employs cool neutral colours. Symmetrical holes form squares on the gallery walls and a birdhouse sculptural chandelier hangs from the ceiling, providing spaces for birds to nest and rest. Waste and discard are cleaned up at the end of each day for aesthetic as well as health and safety reasons. While some of the nesting materials arranged by the finches remain, their collective dwelling efforts are repeatedly thwarted when the nests the finches build (and rebuild) on and around the guitars are removed at the end of each day. Forced to adapt over and over again to their situation and nest in their temporary home, the birds place grasses on top of the glossy lacquered surfaces of the guitars, embed nesting materials in between the guitar strings, twist grasses around the volume-control dials, and relentlessly dwell.

In *from here to ear*, Boursier-Mougenot creates a system for generating music where compositional creation lies in the beaks, wings, feet, and feathers of the zebra finches, whether or not they are conscious of the artistic role assigned to them. "I never produce on the paper what can happen with [the] bird[s] because I don't know what they are going to do," Boursier-Mougenot explained during the installation of *from here to ear* v. 20 at Steadings Gallery in Scotland. "At the end it's very complex. I don't control the input, but I try to control what is the result" (Jupiter Artland 2016). These flexible systems allow for both control and play, highlighting an interactive relationality between materiality, performer, gesture, and multisensory experience, including hearing touch as the birds physically connect with the amplified materials of their gallery ecosystem. The installation is "a device — a plan. It's a piece that's impossible for humans to play" (Boursier-Mougenot in peabodyessexmuseum 2014). The arrangement and spatialization of the guitars, cymbals, amplifiers, sand, grasses, and walkways create both an ecosystem as well as an extended musical system with which the birds interact to create music. Boursier-Mougenot has referred to it as "living music" (CBC News 2015). Even the movements of the visitors become a part of the soundscape, as the zebra finches react to individual physical movements, gestures, voices, and collective presence in the room, creating a musical environment that, like a soundscape, constantly changes, is unpredictable, and relational. This dynamic and interactive system of materials creates the ecological conditions for an interactive soundscape and collaborative work that involves the visitors, birds, and assemblage of materials extracted from other locations that are reconstituted to conceive a novel ecosystem in the gallery.

Epilogue: The Ethical and Ecological Checks and Balances of Environmental Sound Art

Histories of physical and cultural resource extraction are audible across contemporary sonic culture and artists compose a range of affective responses to the varied forms in which extraction is experienced. Only recently has music studies made strides in addressing the varied environmental costs associated within the ecology of music, which includes the infrastructures, consumption, production, and circulation of music. I maintain that this conversation must also consider the politics, ethics, and aesthetics of extractivism in environmental sound art. By considering the different and sometimes contradictory instances of extraction in environmental sound art, I am aligning the aesthetic, affective, and political work enacted by these artists and their compositions with what Szeman has called the "energy humanities" and thinking through what considerations of extraction and resources mean in music and sound studies.

Methods of soundscape listening and storage — including installation, digital storage, playback formats, and field recording practices — have a material *and* an ecological impact. Streaming, for example, is frequently positioned as an opportunity for endless data storage and playback and the ability to listen to anything, anytime, anywhere. However, streaming music and soundscapes are not a "dematerialized" form of listening. As Devine has highlighted in *Decomposed*, the "nonmusical actions and nonhuman materials constitute the grounds upon which more obviously musical cultures are built" (2019: 18). These nonhuman materials and seemingly nonmusical actions extend to the soundscape recordings and field recording sites that have fascinated field recordists for decades. Extractivist environmental sound art also comes at an ecological cost when we consider the friction between the apparent agency and the lack of control the nonhuman animal has in the ways their sounds, acoustic communication, and bodies are used by artists. As Shannon Mattern has explicated, urbanization — and I would add making and consuming environmental sound art — is a "muddy business" as many facets of culture are "utterly dependent on 'nature's' geological resources" (2017: 89). Extractivism in environmental sound art is complicated because artists are constantly negotiating the degree to which they impact and potentially harm the very places, environments, and ecologies for which their work is advocating. In these works Westerkamp, Cusack, and Boursier-Mougenot have used careful approaches to listening, compositional methods that reuse site-specific sonic materials, and practices of field recording, sampling, and installation that increase the accessibility of environmentally damaged, dangerous, precarious, or inaccessible soundscapes. However, it is imperative that environmental sound

artists operate within a system of ethical checks and balances as they negotiate the array of ecological costs that may or may not outweigh the ecological benefits of their work.

Notes

1. For further scholarship on music and the coal and oil industries across the Appalachian region, see Stimeling (2012; 2015).

2. For an overview of environmental humanities scholarship that explores both literal extraction and cultural approaches to extraction, see Junka-Aikio and Cortes-Severino (2017).

3. See Størvold (2019) for a close reading of three examples that respond musically to environmental debates and political tensions in Iceland during the period 2006–2009 in relation to the Kárahnjúkar Hydropower Plant.

4. In each of my three environmental sound art case studies I use the artists' terms to frame their work and ecological motivations for using environmental sound. For example, while Westerkamp and Cusack both compose with sounds they recorded in the field and use transparent editing techniques in the studio, Westerkamp aligns herself with the sound art tradition of soundscape composition, while Cusack coined the term sonic journalism to align his sonic practice with journalistic communication methods.

5. For further scholarship on the artistic practice of field recording, see Barclay and Gifford (2018), Demers (2009), DeLaurenti (2015), McCartney (2002).

6. Even territories covered by treaties were not necessarily ceded because in many cases the Indigenous leaders entering into the agreement were doing so under the expectation that the land and resources covered by the agreements would be shared and that they were not relinquishing rights to their traditional ancestral lands.

7. R. Murray Schafer is too often the only person who makes it into the conversation concerning music, sound, and the environment. Yet the ideas presented in his widely cited and read book *The Tuning of the World* (1977) were developed by the entire collective of The World Soundscape Project. Following Schafer's departure from the group, Westerkamp and Barry Truax maintained and broadened the World Soundscape Project practiced-based research at Simon Fraser University. Truax (1996, 2001, 2002, 2008, 2012) and Westerkamp (2002, 2013, 2017, 2018, 2019) along with sonically and socially engaged cohorts of graduate students (see Andrisani [2019], Droumeva [2017], Droumeva and Jordan [2019], Schine [2019]) are responsible for their interdisciplinary scholarship and multimodal projects in acoustic ecology and the vibrant community of listeners fostered through their public outreach initiatives.

8. Westerkamp characterizes these voices in *A Walk Through the City* (1981) as "consisting mostly of single men with alcohol problems" at a time when "Pigeon

Square – like the entire DTES [Downtown Eastside] – was a relatively harmless scene" (2018).

9. Pigeon Park is officially recognized as Pioneer Place. Members of the local community began calling it Pigeon Park because people would frequently come to the park to feed the pigeons. After a series of municipal complaints, the park was paved over in the 1960s because the large quantity of pigeons who returned to the park for feeding was damaging the grass. The pavement has not stopped the pigeons. When I visited Vancouver from 2014 to 2016 for research, I fed the pigeons and their coos and squawks returned with me to Newfoundland and Connecticut (and now Troy) because they were audible on my field recordings. They are memories extracted from that site.

10. Other sound recordings for *A Walk through the City* were sourced from the World Soundscape Project's environmental tape collection at Simon Fraser University, some were recorded by her World Soundscape Project colleague Howard Broomfield while others were recorded by Westerkamp.

11. For more detail on Westerkamp's recording, listening, and compositional processes, see Kolber (2002), McCartney (2002), Westerkamp (1999, 2002), and Woloshyn (2013).

12. Generally associated with the legacy of anthropologist Franz Boas and his students at the turn of the 20th century, salvage ethnography involved the collection, extraction, and preservation of cultural objects and expressive culture from communities deemed "threatened" and "vulnerable" by urbanization, industrialization, and, more recently, the transformative forces of modern technological developments, capitalism, and globalization.

13. The effects and traces of various forms of sonic violence are examined at length in the works of Cusick (2008), Daughtry (2014), Goodman (2010), and Johnson (2011). Anthropogenic environmental trauma and violence experienced by nonhuman nature are framed as "disaster," "catastrophe," and "change" because violence inflicted upon the nonhuman (as well as marginalized humans) is evaluated on different terms than trauma experience by human beings.

14. For further scholarship on the intersectionality of environmental discard, equity, and social justice, see Lerner (2012). See also Liboiron (2013, 2021) and Chen (2012): 159–88.

15. Boursier-Mougenot finished his first version of from here to ear in 1995 and the work was presented at MoMA PS1 in 1999. Since then, different versions and configurations of the installation have been exhibited under the generic title *from here to ear*. The installation I attended was staged in the Pavillon Jean-Noël Desmarais at the Musée des beaux-arts de Montréal/Montreal Museum of Fine Arts from November 25, 2015, until March 27, 2016. *from here to ear* has travelled internationally with installations in Paris, Linz, Copenhagen, Brisbane, and London. While I focus on v.19, there are multiple versions of *from here to ear* and while each iteration is distinct, there are common features that unite the series. Each installation includes a mixed-age flock of zebra finches (about half males and half females; the

number of birds varies among versions) and an assemblage of electric guitars, birdseed, water, and grasses installed temporarily in the designated gallery space.

16. This was the set of directions I was given when I visited the installation in Montréal.

17. For a floor plan that maps the guitar tuning and spatialization for *from here to ear* installed at the Barton Gallery at the Peabody Essex Museum in Salem, Massachusetts, see Mirin (2014).

18. A number of scholars have turned their attention to the ecological costs of music industries and infrastructures, addressing the variety of ways the production and consumption of music impacts the environment. See, for instance, Boudreault-Fournier and Devine (2021), Brennan (2021), Brennan and Devine (2019, 2020), Bates (2020), Devine (2019), and Roy (2020).

19. See Bronfman (2021) for an excellent example of work in the anthropology of sound that examines the intersection of mining for mica and music production.

20. For further scholarship on energy humanities and petrocultures, see Bellamy and Diamanti (2018), Szeman (2015), and Wilson, Carlson, and Szeman (2017).

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